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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/427,639	10/27/1999	SHUNPEI YAMAZAKI	0756-2053	3558

22204 7590 03/14/2003

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EXAMINER

NELSON, ALECIA DIANE

ART UNIT	PAPER NUMBER
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2675

DATE MAILED: 03/14/2003

18

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/427,639

Applicant(s)

YAMAZAKI ET AL.

Examiner

Alecia D Nelson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. ***Claims 1-8, 10-20, and 32-45*** are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Independent **claims 1, 3, 6, and 32-34** all claim "wherein said n-speed field sequential color signal generation circuit comprises at least one third thin film transistor over said substrate", which is not described in the specification in such a way as to reasonably convey to one skilled in the art that the limitation was in possession of the inventors at the time the application was filed. **Claims 2, 4, 5, 7, 8, 10-20, 35-45** are rejected for being depended on a rejected base claim.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. ***Claims 1-8, 10-20, and 32-45*** rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Independent **claims 1, 3, 6, and 32-**

34, all claim "wherein said n-speed field sequential color signal generation circuit comprises at least one third thin film transistor over said substrate", however, it is not clear as to if the applicant means that the n-speed field sequential color signal generation circuit is made up of at least 1/3 of the thin film transistors formed over the substrate, or if it is meant to state that there is a third thin film transistor that makes up the n-speed field sequential color signal generation circuit. **Claims 2, 4, 5, 7, 8, 10-20, 35-45** are rejected for being depended on a rejected base claim. The claims will be rejected as best understood by the examiner.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

7. **Claims 1-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admittance of prior art in view of Ernstoff et al. (U.S. Patent No. 4,090,219) and Kubota et al. (U.S. Patent No. 6,300,927).

With reference to **claims 1, 3, 6, and 9** the Applicant discusses the conventional art of a field sequential driving method in which one image frame is divided into three subframes and each one of the red, green, and blue backlights are turned on for one-third frame duration to display an image corresponding to that color for one-third frame duration. The Applicant also discusses that the video signal supplied to the liquid crystal panel is obtained by compressing an original red, green, and blue video signal entered from outside to one-third the time axis direction, and that the R, G, and B LEDs are turned on successively during their corresponding LED turn-on periods (Tr, Tg, Tb) (see page 2, line 11-page 3, line 21).

Even though there is no reference of an n-speed field sequential color signal generation circuit, it is clear that there has to be some type of circuitry to compress the incoming RGB video signals and some type of signal to the backlight for turning on the LEDs accordingly. Further, there is no discussion towards displaying each of the red, green, and blue images in the subframes. The admitted prior art also fails to discuss the specific components of the liquid crystal panel, however does discuss using an AM-LCD.

Ernstoff et al. teaches a liquid crystal field sequential color display in which one image frame comprises 2 fields, each of which comprises a red image, a green image, and a blue image (see column 7, line 68-column 8, line 34). With further reference to claims 3 and 6, Ernstoff et al., teaches that three light sources (204, 206, 208) representing each primary color are operated one at a time, in a repetitive sequence by switch (216), at a rate such that the complete 3-color sequence is completed more rapidly than the flicker fusion frequency. A sync means (222) controls switching means (216) supplying power to the light sources in the manner indicated in Fig 10 (see column 7, lines 40-58). With reference to **claims 2, 4, and 7**, Ernstoff et al. fails to specifically teach that each frame comprises 3 fields, however it would be possible to have 3 fields in each frame by shortening the duration of each field thereby further reducing the amount of flicker seen by the observer.

Kubota et al. teaches that a conventional active matrix liquid crystal display that uses TFTs to build an active matrix circuit. An insulating substrate (400) is made of glass or the like, wherein a signal line driver circuit (401) and a scanning line driver circuit (402) are constructed from polysilicon TFTs simultaneously with TFTs forming an active matrix circuit (403).

With reference to **claims 5 and 8** none of the references teach or fairly disclose the usage of a ferroelectric liquid crystal in the driving method, however the usage of ferroelectric liquid crystal is well known in the art in such driving methods.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have a AM-LCD constructed similar to that which is taught by

Kubota et al., along with the drive method as taught by Ernstoff et al., to that which was admitted by the applicant with reference to conventional art, to thereby provide a liquid crystal field sequential display that has improved display quality and reduced amount of flicker observed by the user.

8. **Claims 10-31** are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admittance of prior art in view of Ernstoff et al. and Kubota et al. as applied to **claims 3 and 9** above, and further in view of McDowall et al. (U.S. Patent No. 5,528,262).

With reference to the claims neither the admittance of prior art, Ernstoff et al., nor Kubota et al. teach the particular type of devices that contain the liquid crystal device.

McDowall et al. teaches, with specific reference to **claims 10 and 21**, that construction of a color display with particular advantages for head-mounted and head-coupled displays (see abstract). However with reference to **claims 11-20 and 22-31**, McDowall et al. further states field sequential displays are of great interest in situations that require small color displays (see column 2, lines 34-44).

Therefore it would have been obvious to allow for the liquid crystal display device with a reduction in noticeable flickering to be constructed in a plurality of different devices to thereby increase the marketability of the product.

9. **Claims 32-34** are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admittance of prior art in view of Ernstoff et al. (U.S. Patent No. 4,090,219),

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Kubota et al. (U.S. Patent No. 6,300,927), and Konno et al. (U.S. Patent No. 5,327,229).

With reference to **claims 32-34** the Applicant discusses the conventional art of a field sequential driving method in which one image frame is divided into three subframes and each one of the red, green, and blue backlights are turned on for one-third frame duration to display an image corresponding to that color for one-third frame duration. The Applicant also discusses that the video signal supplied to the liquid crystal panel is obtained by compressing an original red, green, and blue video signal entered from outside to one-third the time axis direction, and that the R, G, and B LEDs are turned on successively during their corresponding LED turn-on periods (T_r , T_g , T_b) (see page 2, line 11-page 3, line 21).

Even though there is no reference of an n-speed field sequential color signal generation circuit, it is clear that there has to be some type of circuitry to compress the incoming RGB video signals and some type of signal to the backlight for turning on the LEDs accordingly. Further, there is no discussion towards displaying each of the red, green, and blue images in the subframes. The admitted prior art also fails to discuss the specific components of the liquid crystal panel, however does discuss using an AM-LCD, as well as the usage of a light conductor plate for making the light rendered from the LED backlight more uniformed.

Ernstoff et al. teaches a liquid crystal field sequential color display in which one image frame comprises 2 fields, each of which comprises a red image, a green image, and a blue image (see column 7, line 68-column 8, line 34). Ernstoff et al. fails to

specifically teach that each frame comprises 3 fields, however it would be possible to have 3 fields in each frame by shortening the duration of each field thereby further reducing the amount of flicker seen by the observer. Ernstoff et al. also teaches that three light sources (204, 206, 208) representing each primary color are operated one at a time, in a repetitive sequence by switch (216), at a rate such that the complete 3-color sequence is completed more rapidly than the flicker fusion frequency. A sync means (222) controls switching means (216) supplying power to the light sources in the manner indicated in Fig 10 (see column 7, lines 40-58)

Kubota et al. teaches that a conventional active matrix liquid crystal display that uses TFTs to build an active matrix circuit. An insulating substrate (400) is made of glass or the like, wherein a signal line driver circuit (401) and a scanning line driver circuit (402) are constructed from polysilicon TFTs simultaneously with TFTs forming an active matrix circuit (403).

Konno et al. teaches the usage of a photo-conductive layer (23) in which the impedance thereof is fairly constant by controlling the light absorbance characteristics of the dielectric mirror (24) as such that a leakage of light is reduced and thereby providing a uniform amount of light received by the display.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to combine that which is taught by Konno et al. to the liquid crystal display as taught by Kubota et al., the drive method as taught by Ernstoff et al. and that which is admitted by the applicant with reference to conventional art, to thereby provide

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a liquid crystal field sequential display that has improved display quality and reduced amount of flicker observed by the user.

10. **Claims 35-45** are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admittance of prior art in view of Ernstoff et al., Kubota et al. and Konno et al. as applied to **claims 32-34** above, and further in view of McDowall et al. (U.S. Patent No. 5,528,262).

With reference to the claims neither the admittance of prior art or Ernstoff et al. teaches the particular type of devices that contain the liquid crystal device.

McDowall et al. teaches, with specific reference to claim 35, that construction of a color display with particular advantages for head-mounted and head-coupled displays (see abstract). However with reference to claims 36-45, McDowall et al. further states field sequential displays are of great interest in situations that require small color displays (see column 2, lines 34-44).

Therefore it would have been obvious to allow for the liquid crystal display device with a reduction in noticeable flickering to be constructed in a plurality of different devices to thereby increase the marketability of the product.

Response to Arguments

11. Applicant's arguments with respect to **claims 1-45** have been considered but are moot in view of the new ground(s) of rejection.

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Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alecia D Nelson whose telephone number is (703)305-0143. The examiner can normally be reached on Monday-Friday 9:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Saras can be reached on (703)305-9720. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9314 for regular communications and (703)872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-9700.

adnADN
March 6, 2003


STEVEN SARAS
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